

**What is claimed is:**

1. (amended) An air separator comprising an air compression means for taking in air from the outside and compressing it at a low pressure, an oxygen concentrating means for concentrating oxygen gas that is contained in the air compressed by the air compression means, an oxygen/air compression means for further compressing oxygen-rich compressed air (X) passed through the oxygen concentrating means, a heat exchanger for cooling oxygen-rich compressed air (Y) passed through the oxygen/air compression means, and a rectification tower for taking out oxygen gas by separating the high-density oxygen-containing compressed air (Y) passed through the heat exchanger so as to be cooled to a low temperature by utilizing differences in boiling points of elemental gases, wherein the air compression means, the oxygen concentrating means and the oxygen/air compression means are arranged in one line and the total amount of the compressed air compressed by the air compression means is supplied to the oxygen/air compression means.

2. (No change) An air separator as set forth in claim 1, wherein the oxygen concentrating means is an adsorption tower containing an adsorbent for adsorbing nitrogen gas in the compressed air, the adsorbent capable of also adsorbing impurities such as moisture in the compressed air.

3. (No change) An air separator as set forth in claim 1 or claim 2, further comprising an elimination means for eliminating impurities in the oxygen-rich compressed air (Y) between the oxygen/air compression means and the heat exchanger.

4. (No change) An air separator as set forth in any one of claim 1 to claim 3, wherein a part of the air compressed by the air compression means is not passed through the oxygen concentrating means, but is directly supplied to an inlet path for introducing the oxygen-rich compressed air (X) passed through the oxygen concentrating means into the oxygen/air compression means.